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10/688,802	10/16/2003	Phillip A. Hetherington	11336/592 (P3131USP)	9753

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EXAMINER	
HARPER, VINCENT PAUL	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/688,802	HETHERINGTON ET AL.	
	Examiner	Art Unit	
	V. Paul Harper	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The Examiner has considered the references listed in the Information Disclosure Statements dated 11/01/2007 and 10/01/2007. Copies of the Information Disclosure Statements are attached to this office action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 9, 11-13, 15, 28-30, 32, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo et al. (US Patent 6,959,276), hereinafter referred to as Droppo, in view of Yang et al. (US Patent Application Publication 2003/0040908 A1), hereinafter referred to as Yang.

Regarding **claim 1**, Droppo teaches techniques for noise identification and reduction based on the type of noise. In addition, Droppo teaches:

- a first noise detector that is adapted to detect [specific environmental noise types] from an input signal by modeling (Fig. 6, Environment Identifier, item 609; col. 9,

lines 1-4, identify the noise environment ....; col. 10, lines 50-55, pattern recognition system uses a model for identification purposes);

- a noise attenuator electrically connected to the first noise detector to substantially remove the [identified noise type] the input signal (Fig. 6, Noise Reduction, item 610; col. 10, lines 50-60; noise reduction module.

But Droppo does not specifically disclose "a first noise detector that is **adapted to detect a wind buffet** from an input signal by modeling; and a noise attenuator electrically connected to the first noise detector to substantially **remove the wind buffet** from the input signal." However, the examiner contends that this concept was well known in the art, as taught by Yang

In the same field of endeavor, Yang discloses a noise suppression system where wind noise is one of the environmental noises detected and eliminated (¶'s 6 and 24).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically adding wind noise to the environments trained for, detected and eliminated (see Fig. 4, Environment-1, etc.), as taught by Yang, because it is well known in the art at the time of invention for the purpose of eliminating a common noise source present in automobiles (i.e., wind noise) that can interfere with normal hearing and speech recognition (Yang, ¶'s 5, 6; also Droppo col. 1, lines 5-20).

Regarding **Claim 9**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). In addition, Droppo teaches "the noise attenuator is

configured to substantially remove the wind buffet and a continuous noise from the input signal" (Fig. 6, item 610; col. 10, lines 50-60, since the noise is detected and classified on a frame-by-frame basis this approach will handle both changing and steady-state noise).

Regarding **claim 11**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). In addition, Yang teaches "including an input device electrically coupled to the first noise detector, the input device configured to convert sound waves into analog signals" (Fig. 6, items 604, 606 to item 609).

Regarding **claims 12 and 13**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). But Droppo does not specifically teach (claim 12) "a pre-processing system coupled to the first noise detector, the pre-processing system configured to pre- condition the input signal before the first noise detector processes it" and (claim 13) "the pre-processing system comprises first and second microphones spaced apart and configured to exploit a lag time of a signal that may arrive at the different detectors However, the examiner contends that this concept was well known in the art, as taught by Yang.

Yang teaches that the signal is filtered and amplified before being subjected to further signal processing (¶ 24) and that additional microphones can be used to improve the quality of the resulting signals by utilizing the delays between the microphones (Fig. 7, ¶s 74-84).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo in view of Yang by specifically providing the features, as taught by Yang, because it is well known in the art at the time of invention for the purpose of producing higher quality results by first conditioning the signal and utilizing the directional capabilities that are possible with multiple microphones (Yang, ¶ 74); multiple microphones also allow for one or more microphones to be used to detect specific noise sources (such as wind noise, Yang, ¶89).

Regarding **claim 15**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 13). In addition, Yang teaches "a second noise detector coupled to the first noise detector and the first microphone" (abstract, a second signal detector, e.g., Figs. 2, 3, 4A).

Regarding **claim 28**, Droppo teaches techniques for noise identification and reduction based on the type of noise. In addition, Droppo teaches:

- a detector that converts sound waves into electrical signals (Fig. 6, item 600, microphone);
- a spectral conversion logic that converts the electrical signals from a first domain to a second domain (Fig. 6, item 608, Feature Extractor; col. 6, lines 40-50); and
- a signal analysis logic that models a portion of the sound waves that are associated with [an environmental noise source] (Fig. 6, Environment Identifier, item

609; col. 9, lines 1-4, identify the noise environment ....; col. 10, lines 50-55, pattern recognition system uses a model for identification purposes).

But Droppo does not specifically teach "a signal analysis logic that models a portion of the sound waves that are associated with **the wind to detect a wind buffet**." However, the examiner contends that this concept was well known in the art, as taught by Yang

In the same field of endeavor, Yang discloses a noise suppression system where wind noise is one of the environmental noises detected and eliminated (¶'s 6 and 24).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically adding wind noise to the environments trained for, detected and eliminated (see Fig. 4, Environment-1, etc.), as taught by Yang, because it is well known in the art at the time of invention for the purpose of eliminating a common noise source present in automobiles (i.e., wind noise) that can interfere with normal hearing and speech recognition (Yang, ¶'s 5, 6; also Droppo col. 1, lines 5-20).

Regarding **claim 29**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 28). In addition, Droppo teaches: "comprising logic that derives a portion of a voiced signal masked by the noise" (Fig. 6, item 600 speaker to item 610 Noise Reduction; col. 11, lines 10-15).

Regarding **claim 30**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 28). In addition, Droppo teaches "logic that attenuates portion of the sound waves" (Fig. 6, item 610, Noise Reduction).

Regarding **claim 32**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 28). In addition, Droppo teaches "noise estimation logic that measures a continuous or ambient noise sensed by the detector" (Fig. 6, item 609).

Regarding **claim 34**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 28). In addition, Droppo teaches "the signal analysis logic is coupled to an audio system" (col. 1, lines 6-67, a clean signal can be sent to a speech recognizer [audio system]).

Regarding **claim 35**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 28). In addition, Droppo teaches "where the signal analysis logic models only the sound waves that are associated with the wind" (as previously taught by Yang the environment can be wind, and in Fig. 3 of Droppo, "select environment" implies that it can be used to only model wind).

3. Claims 2, 8, 16, 18-20, 23, 24, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo in view of Yang and Ljung ("System Identification Theory for the User" Prentice Hall, 1999, pp. 1-14), hereinafter referred to as Ljung.

Regarding **claim 2**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). But Droppo does not specifically teach "where the first noise detector models a line to a portion of the input signal." ...." However, the examiner contends that this concept was well known in the art, as taught by Ljung

Ljung system identification and modeling where graphical models can be constructed from measurements (p. 7, Building Models) and where one of the techniques is the least squares method for fitting a curve to data (p. 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo in view of Yang by specifically providing the techniques, as taught by Ljung, because it is well known in the art at the time of invention for the purpose of inferring models from data (Ljung, p. 1).

Regarding **claim 8,** Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). But Droppo does not specifically teach "where the first noise detector is configured to derive an average wind buffet model that is derived by a weighted average of other modeled signals analyzed earlier in time." However, the examiner contends that this concept was well known in the art, as taught by Ljung

Ljung system identification and modeling where graphical models can be constructed from measurements (p. 7, Building Models) and where the mode is a weighted sum of the inputs (p. 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo in view of Yang by specifically providing the techniques, as taught by Ljung, because it is well known in the art at the time of invention for the purpose of inferring models from data (Ljung, p. 1).

Regarding **claim 16**, Droppo teaches techniques for noise identification and reduction based on the type of noise. In addition, Droppo teaches:

- a time frequency transform logic that converts a time varying input signal into the frequency domain (Fig. 6, items 600-608, the Features Extractor converts the signal; col. 6, lines 40-50);
- a memory ... (Fig. 2, item 200)
- a background noise estimator coupled to the time frequency transform logic, the background noise estimator configured to measure a continuous noise that occurs near a receiver (Fig. 6, item 602, Additive Noise will include background noise; col. 8, lines 15-26 twenty different noise environments, which include a variety of backgounds); and
- a [specific environment] detector coupled to the background noise estimator, the [Environment Identifier applies rules] to a portion of the input signal in the frequency ... automatically identify a noise associated with [a specific environment based on a model] (Fig. 6, item 609; col. 9, lines 1 through col. 10, line 27, making a separate environment decision for each frame where the most likely environment is the environment that has the highest probability of producing the signal, which is determined by the distance measure from the noisy feature vector and the model [see below]).

But Droppo does not specifically disclose "a memory comprising **wind buffet** [model]" and "a **wind noise detector** coupled to the background noise estimator, the **wind noise detector** ... and automatically identify a noise associated with wind ...". However, the examiner contends that this concept was well known in the art, as taught by Yang

In the same field of endeavor, Yang discloses a noise suppression system where wind noise is one of the environmental noises detected and eliminated (¶'s 6 and 24) and that a separate sensor can be used during noise detection (e.g., Fig. 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically adding wind noise to the environments trained for, detected and eliminated (see Fig. 4, Environment-1, etc.), as taught by Yang, because it is well known in the art at the time of invention for the purpose of eliminating a common noise source present in automobiles (i.e., wind noise) that can interfere with normal hearing and speech recognition (Yang, ¶'s 5, 6; also Droppo col. 1, lines 5-20) and furthermore the addition of a second sensor can improve the identification process by allowing the sensor to be placed closer to a potential noise source (Yang, ¶ 22).

As stated above Droppo teaches the identification of the noise environment, but Droppo does not specifically teach "a memory comprising wind buffet **line fitting rules**" and "a wind noise detector coupled to the background noise estimator, the wind noise detector configured to apply the wind buffet **line fitting rules to a line fit to a portion** of the input signal in the frequency domain **to obtain a constrained line** adhering to

the wind buffet **line fitting rules**, ..." However, the examiner contends that this concept was well known in the art, as taught by Ljung

Ljung system identification and modeling where graphical models can be constructed from measurements (p. 7, Building Models) and where one of the techniques is the least squares method for fitting a curve to data (p. 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo in view of Yang by specifically providing the techniques, as taught by Ljung, because it is well known in the art at the time of invention for the purpose of inferring models from data (Ljung, p. 1).

Regarding **claim 18,** Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 16). In addition, Droppo teaches "where the wind noise detector is configured to derive a correlation between the line and a portion of the input signal" (col. 9, line 1 through col. 10, line 30; the environment with the highest probability of a match is selected).

Regarding **claim 19**, Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 16). Droppo teaches the input of training (environment noise) and test (speech) signals, but Droppo does not specifically teach "a signal discriminator coupled to the wind noise detector, the signal discriminator configured to mark a voice and a noise segment of the input signal." However, the examiner contends that this concept was well known in the art, as taught by Yang

Yang teaches the use of a voice activity detector that is used to detect the presence of voice (Fig. 1, ¶28).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically adding the voice activity detector, because the ability to distinguish between noise and speech will aid in both the training and the detection of noisy frames.

Regarding **claim 20**, Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 16). In addition, Droppo teaches "a wind noise attenuator coupled to the wind noise detector, the wind noise attenuator configured to reduce the noise associated with the wind that is sensed by the receiver" (Fig, 6, item 610, Noise Reduction, where the environment detected would be wind noise, as taught by Yang, above).

Regarding **claim 23**, this claim has limitations similar to claims 16 and 20 and is rejected for the same reasons.

Regarding **claim 24**, Droppo teaches techniques for noise identification and reduction based on the type of noise. In addition, Droppo teaches:

- converting a time varying signal to a complex spectrum (Fig. 6, items 600-608, the Features Extractor converts the signal; col. 6, lines 40-50);

- estimating a background noise (Fig. 6, item 602, Additive Noise will include background noise; col. 8, lines 15-26 twenty different noise environments, which include a variety of backgounds);
- detecting the [environmental noise] when a high correlation exists between the line and the portion of the input signal receiver (Fig. 6, item 609; col. 9, lines 1 through col. 10, line 27, making a separate environment decision for each frame where the most likely environment is the environment that has the highest probability of producing the signal, which is determined by the distance measure from the noisy feature vector and the model [see below]);
- dampening the [environmental noise] in the input signal to obtain a noise-reduced signal (Fig, 6, item 610, Noise Reduction, where the environment detected would be wind noise, see below).

But Droppo does not specifically disclose "detecting the **wind buffet** when a high correlation exists between the line and [the portion of the input signal; and dampening the **wind buffet** in the input signal to obtain a noise-reduced signal." However, the examiner contends that this concept was well known in the art, as taught by Yang

In the same field of endeavor, Yang discloses a noise suppression system where wind noise is one of the environmental noises detected and eliminated (¶'s 6 and 24) and that a separate sensor can be used during noise detection (e.g., Fig. 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically adding wind noise to the environments trained for, detected and eliminated (see Fig. 4, Environment-1, etc.),

as taught by Yang, because it is well known in the art at the time of invention for the purpose of eliminating a common noise source present in automobiles (i.e., wind noise) that can interfere with normal hearing and speech recognition (Yang, ¶'s 5, 6; also Droppo col. 1, lines 5-20) and furthermore the addition of a second sensor can improve the identification process by allowing the sensor to be placed closer to a potential noise source (Yang, ¶ 22).

As stated above Droppo teaches the identification of the noise environment, but Droppo does not specifically teach "**fitting a line to a portion of the input signal**". However, the examiner contends that this concept was well known in the art, as taught by Ljung

Ljung system identification and modeling where graphical models can be constructed from measurements (p. 7, Building Models) and where one of the techniques is the least squares method for fitting a curve to data (p. 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo in view of Yang by specifically providing the techniques, as taught by Ljung, because it is well known in the art at the time of invention for the purpose of inferring models from data (Ljung, p. 1).

Regarding **claim 26**, Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 24). In addition, Droppo teaches "where detecting the wind buffet comprises applying wind buffet line fitting rules to the line to obtain a constrained line adhering to the wind buffet line fitting rules the act of dampening the

wind buffet comprises substantially removing the wind buffet from the input signal" (Fig. 6, item 609; col. 9, lines 1 through col. 10, line 27, making a separate environment decision for each frame where the most likely environment is the environment that has the highest probability of producing the signal, which is determined by the distance measure from the noisy feature vector and the model [see above for "wind buffet teaching" by Yang, and "line fitting rules" by Ljung]; Fig. 6, Droppo also teaches the noise reduction based on the identifies environment).

Regarding **claim 27**, this claim has limitations similar to claim 24 and is rejected for the same reasons (where "removing the wind buffet" corresponds to "dampening the wind buffet").

4. Claims 3 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo in view of Yang and Ljung, and further in view of well known prior art (MPEP 2144.03).

Regarding **claim 3**, Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 2). But Droppo does not specifically teach "where the first noise detector is configured to fit a line to a portion of the input signal in a SNR domain." As previously argued Ljung teaches techniques fitting a line to a portion of a signal and Droppo teaches the use of a transformed domain (spectrum) (see previous rejection). Furthermore, the examiner takes official notice of the fact that the use of a

SNR domain for the purpose of representing and calculating numbers in the frequency domain was well known in the art (i.e., dB operation).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Droppo in view of Ljung, because wind noise is typically characterized as 1/f noise which when represented on a log scale plots as a straight line simplifying the modeling process (i.e., a linear regression).

Regarding **claim 21**, Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 16). Ljung teaches the use of linear models, but Ljung does not specifically teach "where the wind buffet line fitting rules comprise wind buffet slope rules, wind buffet offset rules, and wind buffet coordinate point rules." However, the examiner takes official notice of the fact that the use of slopes, offsets, and coordinate points for the purpose of specifying a line was well known in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo in view of Yang and Ljung such that the models include this information, because this is the conventional data used to represent lines.

5. Claims 4, 10 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo in view of Yang and further in view of Buchele (US Patent Application Publication 2003/0151454), hereinafter referred to as Buchele

Regarding **claim 4**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). But Droppo does not specifically teach "where the first noise detector is configured to model the wind buffet by calculating a y-intercept for a line fit to the input signal." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector [signal offset] circuit that can respond to wind gusts (I.e., when the amplitude of the signal crosses a line it detects a wind gust) and suppresses them (¶s 34 and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically providing feature, as taught by Buchele, because it is well known in the art at the time of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintain quality speech communications.

Regarding **claim 10**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). But Droppo does not specifically teach "a residual attenuator electrically coupled to the first noise detector and the noise attenuator to dampen signal power in a low frequency range when a large increase in a signal power is detected in the low frequency range." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector [signal offset] circuit that can respond to wind gusts (I.e., when the amplitude of the signal crosses a line it detects a wind gust) and suppresses them (¶s 34 and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically providing feature, as taught by Buchele, because it is well known in the art at the time of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintain quality speech communications.

Regarding **claim 31**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 28). But Droppo does not specifically teach "further comprising attenuator logic operable to limit a power in a low frequency range." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector [signal offset] circuit that can respond to wind gusts (I.e., when the amplitude of the signal crosses a line it detects a wind gust) and suppresses them (¶s 34 and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically providing feature, as taught by Buchele, because it is well known in the art at the time of invention for the

purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintain quality speech communications.

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo in view of Yang, Ljung and further in view of Buchele (US Patent Application Publication 2003/0151454), hereinafter referred to as Buchele.

Regarding **claim 22**, Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 16). But Droppo does not specifically teach "a residual attenuator coupled to the background noise estimator operable to dampen signal power in a low frequency range when a large increase in signal power is detected in the low frequency range." However, the examiner contends that this concept was well known in the art, as taught by Buchele.

In the same field of endeavor, Buchele discloses an adaptive speech filter to suppress ambient low frequency noise associated with wind and the use of a peak detector [signal offset] circuit that can respond to wind gusts (I.e., when the amplitude of the signal crosses a line it detects a wind gust) and suppresses them (¶s 34 and 40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo by specifically providing feature, as taught by Buchele, because it is well known in the art at the time of invention for the purpose of being responsive to rapidly changing circumstances (Buchele, ¶11) and thus maintain quality speech communications.

7. Claims 5, 6 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo in view of Yang and further in view of Vilmur et al. (US Patent 4,811,404), hereinafter referred to as Vilmur.

Regarding **claim 5**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). But Droppo does not specifically teach "where the first noise detector is configured to prevent a newly calculated value of an attribute of the modeled wind buffet from exceeding an average value." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevent if transient noise is present (col. 6, lines 3-11 and lines 24-39 if VMSUM is greater than the UPDATE THRESHOLD then the background noise update is not performed).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Droppo by providing the features, as taught by Vilmur, because a higher quality noise model results when the model is updated only when noise is present (and not speech or noise spikes).

Regarding **claim 6**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). But Droppo does not specifically teach "where the first noise detector is configured to limit a wind buffet correction when a vowel or a harmonic

like structure is detected." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevent if transient noise (which could be speech data) is present (col. 6, lines 3-11 and lines 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Droppo by providing the features, as taught by Vilmur, because a higher quality noise model results when the model is updated only when noise is present.

Regarding **claim 33**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 32). But Droppo does not specifically teach "transient logic that disables the noise estimation logic when an increase in power is detected." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevent if transient noise is present (col. 6, lines 3-11 and lines 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Droppo by providing the features, as taught by Vilmur, because a higher quality noise model results when the model is updated only when short transient noise peaks are absent.

8. Claims 17 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo in view of Yang and Ljung and further in view of Vilmur.

Regarding **claim 17**, Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 16). But Droppo does not specifically teach "comprising a transient detector configured to disable the background noise estimator when a transient signal is detected." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevent if transient noise is present (col. 6, lines 3-11 and lines 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Droppo by providing the features, as taught by Vilmur, because a higher quality noise model results when the model is updated only when noise is present.

Regarding **claim 25**, Droppo in view of Yang and Ljung teaches everything claimed, as applied above (see claim 24). But Droppo does not specifically teach "where the act of estimating the background noise comprises estimating the background noise when a transient is not detected." However, the examiner contends that this concept was well known in the art, as taught by Vilmur.

In the same field of endeavor, Vilmur discloses a noise suppression system where a background update decision is prevent if transient noise (which could be speech data) is present (col. 6, lines 3-11 and lines 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Droppo by providing the features, as taught by Vilmur, because a higher quality noise model results when the model is updated only when noise is present.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo in view of Yang and further in view of Walker (US Patent Application Publication 2001/0028713), hereinafter referred to as Walker.

Regarding **claim 7**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 1). But Droppo does not specifically teach "where the first noise detector is configured to derive an average wind buffet model, and the average wind buffet model is not updated when a voiced or a mixed voice signal is detected." However, the examiner contends that this concept was well known in the art, as taught by Walker.

In the same field of endeavor, Walker discloses a technique for noise suppression. Walker's technique includes storing the last frequency spectrum recorded during a speech pause (¶'s 15-17) and averaging the spectrums (¶36).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Droppo by providing the features, as taught by Walker, because the presence of speech during a noise model calculation might negatively influence the model (Walker ¶36).

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Droppo in view of Yang and further in view of Coney et al. (US Patent 6,859,420), hereinafter referred to as Coney.

Regarding **claim 14**, Droppo in view of Yang teaches everything claimed, as applied above (see claim 13). But Droppo does not specifically teach "control logic that automatically selects a microphone and a channel that senses the least amount of noise in the input signal." However, the examiner contends that this concept was well known in the art, as taught by Coney.

In the same field of endeavor, Coney discloses methods for adaptive wind noise reduction including the use of multiple sensors where sensors with high noise are given low weights and those with low noise are give high weights (i.e., selecting microphones with lows noise) (col. 2, lines 3-13).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Droppo in view of Yang by specifically providing the feature, as taught by Coney, because it is well known in the art at the time

of invention for the purpose of improving and rejecting wind noise and improving the detection of desired acoustic signals (Coney, col. 2, lines 15-21).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Paul Harper whose telephone number is (571) 272-7605. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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11/15/2007

VPH

V. PAUL HARPER
PRIMARY PATENT EXAMINER